

WHAT IS CLAIMED IS:

1                   1.     A method for the temporary anti-corrosive treatment of a  
2 metal surface that consist predominantly of aluminum and/or zinc, said process  
3 comprising:

4                   a)     placing the surface of the metal in contact with an anti-  
5 corrosive composition comprising 2.0 - 400 g/L phosphate ions, 0.5 - 400 g/L  
6 fluorometallate ions, and having a pH of between 1.0 - 4.0, for a time period of  
7 between 0.1 - 200 seconds;

8                   b)     drying the anti-corrosive treatment composition on the metal  
9 surface to form a primary passivating coating on the metal surface;

10                  c)     removing the primary passivating coating from the metal  
11 surface; and

12                  d)     conversion coating the metal surface.

1                   2.     The method of claim 1 wherein the ratio of fluorometallate  
2 anions and phosphate ions is 0.10:1.0 to 5.0:1.0.

1                   3.     The method of claim 1 wherein the phosphate ions are  
2 provided in a 75% by weight phosphate solution, based on the total weight of the  
3 phosphate solution, and the fluorometallate ions are provided in a 50% by weight  
4 fluorometallate solution, based on the total weight of the fluorometallate solution.

1                   4.     The method of claim 3 wherein the phosphate solution is  
2 present in the composition in an amount of 25 - 65 wt. % and the fluorometallate  
3 solution is present in the composition in an amount of 35 - 75 wt. %, based on the  
4 total weight of the composition.

1                    5.        The method of claim 4 further comprising water present in an  
2        amount of 2 to 50 wt. %, based on the total weight of the composition.

1                    6.        The method of claim 3 wherein the phosphate solution  
2        comprises phosphoric acid and the fluorometallate solution comprises  
3        hexafluorotitanic acid.

1                    7.        The method of claim 6 wherein the phosphoric acid is present  
2        in the composition in an amount of 1.0-15.0 wt. %, based on the total weight of the  
3        composition, and the hexafluorotitanic acid is present in an amount of 1.0-20.0 wt.  
4        %, based on the total weight of the composition, and the composition further  
5        comprising water present in an amount of 45-98 wt. %, based on the total weight  
6        of the composition.

1                    8.        The method of claim 1 wherein the metal surface comprises  
2        steel treated with a galvanic coating comprising aluminum, zinc and silicon.

1                    9.        The method of claim 1 wherein the metal surface comprises  
2        steel treated with a galvanic coating comprising 55% aluminum, 43.5% zinc and  
3        1.5% silicon.

1                    10.      The method of claim 1 wherein the temperature of the  
2        composition during step a) is 15-66°C.

1                    11.      The method of claim 1 wherein the primary passivating  
2        coating method surface is stored after step b) and prior to step c).

1                    12.    The method of claim 1 wherein the removal of step c) takes  
2 place by exposing the primary passivating coating to an alkaline solution.

1                    13.    A chromium-free, anti-corrosive composition for temporarily  
2 passivating metal surfaces consisting predominantly of aluminum and/or zinc, said  
3 composition comprising:

4                    2.0 - 400 g/L phosphate ions; and  
5                    0.5 - 400 g/L fluorometallate anions;  
6                    the composition having a pH of 1.0-4.0.

1                    14.    The composition of claim 13 wherein the ratio of  
2 fluorometallate anions and phosphate ions is 0.10:1.0 to 5.0:1.0.

1                    15.    The composition of claim 13 wherein the phosphate ions are  
2 provided in a 75% by weight phosphate solution, based on the total weight of the  
3 phosphate solution, and the fluorometallate ions are provided in a 50% by weight  
4 fluorometallate solution, based on the total weight of the fluorometallate solution.

1                    16.    The composition of claim 15 wherein the phosphate solution  
2 is present in the composition in an amount of 25 - 65 wt. % and the fluorometallate  
3 solution is present in the composition in an amount of 35 - 75 wt. %, based on the  
4 total weight of the composition.

1                    17.    The composition of claim 16 further comprising water present  
2 in an amount of 2 to 50 wt. %, based on the total weight of the composition.

1                   18.    The composition of claim 15 wherein the phosphate solution  
2 comprises phosphoric acid and the fluorometallate solution comprises  
3 hexafluorotitanic acid.

1                   19.    The composition of claim 18 wherein the phosphoric acid is  
2 present in the composition in an amount of 1.0-15.0 wt. %, based on the total  
3 weight of the composition, and the hexafluorotitanic acid is present in an amount of  
4 1.0-20.0 wt. %, based on the total weight of the composition, and the composition  
5 further comprising water present in an amount of 45-98 wt. %, based on the total  
6 weight of the composition.

1                   20.    The composition of claim 19 further comprising a polymer  
2 solution comprising a polymer comprising the Mannich adduct of  
3 polyhydroxystyrene with N-methylglucamine.

1                   21.    The composition of claim 20 wherein the polymer solution  
2 further comprises an acid selected from the group consisting of fluorotitanic acid  
3 and fluorozeironic acid.